Object Storage Visuals

Modder integration guide

This guide covers the XML entries for storages, pallets and refillable crates. Each section shows where the entry belongs and what its values do.

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Where do the entries go?

Storage: baleStorageVisuals and palletStacking go inside the existing objectStorage block in the storage XML.
Pallet or crate: objectStorageStacking and objectStorageReusablePallet go directly under vehicle in that object's XML.

> The **Default** column shows the value OSV uses when you omit a parameter. For switches, true means on and false means off. Dimensions are in metres with a decimal point.

The examples show the OSV entries only. Keep the existing configuration of your mod. OSV must be enabled in game.

1 Prepare the storage

Start with a working GIANTS objectStorage. OSV uses its storageAreas to place bales or pallets in the storage. The start and end nodes must match the actual storage dimensions.

Storage	supportsBales	supportsPallets	OSV entry
Bales only	true	false	baleStorageVisuals
Pallets only	false	true	palletStacking
Bales and pallets	true	true	neither block

The following storage extensions are intended for bale-only or pallet-only storage. Mixed storage keeps the normal GIANTS display.

Example: bale storage

```
<objectStorage supportsBales="true"
    supportsPallets="false" capacity="110">
    <!-- Keep existing storage entries. -->
    <baleStorageVisuals enabled="true" />
</objectStorage>
```

Example: pallet storage

```
<objectStorage supportsBales="false"
    supportsPallets="true" capacity="250">
    <!-- Keep existing storage entries. -->
    <palletStacking dynamicCapacity="true"
        hardLimit="500" />
</objectStorage>
```

Add the appropriate OSV entry inside your existing objectStorage. Do not create a second objectStorage block.

2 Bale storage: additional pallets

Location: storage XML > objectStorage

```
<baleStorageVisuals enabled="true"
    dynamicCapacity="true" hardLimit="500">
    <!-- Underlay pallets or spare stacks: section 5 -->
</baleStorageVisuals>
```

Parameter	Default	What does it do?
enabled	false	true enables the configured underlay pallets and spare pallet stacks. false hides these additional pallets.
dynamicCapacity	false	true limits admission by the actual space in the storageAreas. false uses the normal storage count limit.
hardLimit	500	Maximum object count while dynamicCapacity is active. More visible space does not raise this limit.

enabled does not make the bales themselves visible. GIANTS objectStorage already displays the bales. This switch controls the additional pallets below them and the spare pallet stacks beside them. See section 5 for those entries.

Dynamic capacity and the moving loading trigger each have their own switch. They do not also require enabled="true" for pallet visuals.

capacity and hardLimit

capacity is the normal object count limit. With dynamicCapacity="true", OSV instead checks whether the next object still fits the visible storage area. hardLimit provides the additional upper limit.

3 Divide bale areas by group

Location: storage XML > objectStorage > storageAreas

Use baleGroups to reserve areas for hay, straw or wrapped bales. Add the attribute to the relevant storageArea.

```
<storageAreas>
    <storageArea startNode="hayStart" endNode="hayEnd"
        maxHeight="4.6" baleGroups="hay" />
    <storageArea startNode="strawStart" endNode="strawEnd"
        maxHeight="4.6" baleGroups="straw" />
    <storageArea startNode="wrapStart" endNode="wrapEnd"
        maxHeight="4.6" baleGroups="wrapped" />
    <storageArea startNode="restStart" endNode="restEnd"
        maxHeight="4.6" />
</storageAreas>
```

Entry	Which bales go there?
hay	Hay and bales mapped as dry forage by OSV.
straw	Straw bales.
wrapped	Wrapped bales, regardless of their contents.
no baleGroups	Unassigned bales and overflow from full group areas.

Separate multiple groups with spaces, for example baleGroups="hay straw". Unwrapped grass is not one of these three groups and needs an area without baleGroups.

With dynamic capacity, objects use matching areas. If the hay area is full, OSV may use an ungrouped area, but not an area reserved for straw. Omitting baleGroups leaves storage ungrouped.

4 Loading triggers for bale storage

Location: inside baleStorageVisuals

The slot trigger is the area where a bale is accepted into storage. It follows the next free storage position. The player trigger is the area where the player can open the storage menu.

```
<slotTrigger enabled="true" movePlayerTrigger="true"
    playerTriggerOffset="0 0 0" />
```

Parameter	Default	What does it do?
enabled	false	true replaces the fixed objectTrigger with the moving loading area.
movePlayerTrigger	false	true moves the menu interaction area with the loading point. false leaves it at its original position.
playerTriggerOffset	0 0 0	Offset of the moving interaction area: X, Y, Z in metres, relative to the slot trigger. 0 0 2 places it 2 m along that trigger's local Z axis.

Separate loading points for bale groups

```
<slotTriggers>
    <slotTrigger baleGroups="hay" />
    <slotTrigger baleGroups="straw" />
    <slotTrigger baleGroups="wrapped" />
    <slotTrigger />
</slotTriggers>
```

These entries use the matching areas from section 3. Each entry is enabled unless disabled with enabled="false". The entry without a group is the fallback trigger. This variant keeps a single shared player trigger for the storage menu.

The old objectTrigger is hidden. Keep markers and warning stripes outside that node if they should stay visible.

5 Underlay pallets and spare stacks

Location: inside baleStorageVisuals

baleStorageVisuals enabled="true" is the main switch for underlay pallets and spare pallet stacks. Within it, palletUnderlays enabled="true" switches on the pallets beneath the bales. Underlay pallets therefore need both switches set to true. To show only a spare pallet stack beside the storage, keep the main switch on and set palletUnderlays to false.

```
<palletUnderlays enabled="true"
    positionVariation="0.025" rotationVariation="1.5"
    rotationY="0" />
```

Parameter	Default	What does it do?
enabled	false	true places pallets below occupied bale positions.
positionVariation	0.025	Small random pallet position variation in metres.
rotationVariation	1.5	Small random rotation variation in degrees.
rotationY	0	Fixed pallet rotation around the Y axis in degrees.

With dynamicCapacity active, OSV also checks whether a suitable underlay pallet is available for the next bale.

Spare pallets beside the storage

```
<palletStacks>
    <palletStack linkNode="stackRef01"
        translation="0 0 0" rotation="0 0 0"
        maxPallets="20" collision="true" />
</palletStacks>
```

linkNode is the node where the stack should stand. translation offsets it in metres and rotation turns it in degrees; both default to 0 0 0. maxPallets sets the maximum pallet count; omitting it lets OSV calculate the count. collision="true" enables the stack's collision; the default is false.

6 Pallet storage and loading trigger

Location: storage XML > objectStorage

```
<palletStacking dynamicCapacity="true" hardLimit="500">
    <slotTrigger enabled="true"
        movePlayerTrigger="true"
        playerTriggerOffset="0 0 0" />
</palletStacking>
```

On palletStacking	Default	What does it do?
enabled	true	true displays suitable pallets in stacks. false disables only this stack display.
dynamicCapacity	false	true checks usable storage space instead of only object count.
hardLimit	500	Maximum count with dynamic capacity.
stackInMultiLevelStorage	false	true permits stacks inside rack compartments; see section 8.

The three slot trigger parameters

On slotTrigger	Default	What does it do?
enabled	false	true moves the loading area to the next free pallet position. Without it, the normal objectTrigger remains active.
movePlayerTrigger	false	true also moves the storage-menu interaction area. false leaves it at its original position.
playerTriggerOffset	0 0 0	X/Y/Z offset of the moving interaction area relative to the loading area, in metres. Example 0 0 2: 2 m along its local Z axis.

The loading point starts at the first position, follows the next free position, and stays at the last occupied position when full. The slot trigger and dynamic capacity also work with palletStacking enabled="false".

7 Rotate pallets

Location: the storage's palletStacking entry

These switches let OSV turn pallets by 90 degrees in the storage display. This is useful when a pallet fits a rack compartment better sideways.

```
<palletStacking rotatePallets="true"
    rotateBigBagPallets="false" />
```

Parameter	Default	Which pallets?
rotatePallets	false	All pallet groups recognized by OSV.
rotateEuroPallets	false	Euro pallets.
rotateBigBagPallets	false	Big bags on pallets.
rotateSquarePallets	false	Square pallets, such as IBCs.
rotateLargePallets	false	Large or long pallets.
rotateBigBags	false	Individual big bags without a pallet.

In this example, all recognized groups may rotate except big bags on pallets. Without rotatePallets="true", only groups whose own switch is true will rotate.

The rotated pallet must fit the compartment with its actual dimensions. The storage areas themselves are still oriented through their start and end nodes in the I3D.

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8 Pallet racks

Give each rack compartment or level its own storageArea. Keep the areas clear of posts, walls and shelf floors. Set maxHeight to the usable height of that compartment.

```
<storageAreas>
    <storageArea startNode="shelf01Start"
        endNode="shelf01End" maxHeight="1.65" />
    <storageArea startNode="shelf02Start"
        endNode="shelf02End" maxHeight="1.65" />
</storageAreas>
<palletStacking dynamicCapacity="true" hardLimit="60"
    stackInMultiLevelStorage="true" />
```

Stacking inside a compartment

OSV detects multiple levels when their start nodes differ by more than 0.35 m in height. Additional stacking is off there by default. stackInMultiLevelStorage="true" allows suitable pallets to stack inside each compartment.

Example: a 1.65 m high compartment can hold two 0.80 m high pallets if their stacking distance is also 0.80 m. If only one layer fits below the shelf, do not increase maxHeight just to admit more pallets.

Exclude certain pallets

maxWidth, maxLength and maxHeight on objectStorage check the normal object size. Use them to exclude oversized pallets. This check happens before visual rotation. Smaller stackWidth or stackLength values do not change it.

Unused space in a compartment remains available if another pallet fits. Compartments are not automatically reserved for one pallet type.

9 Make your pallets stackable

Location: pallet XML, directly under vehicle

Use objectStorageStacking to define how your pallet is stacked in storage. Insert the entry before the closing </vehicle> line.

```
<objectStorageStacking enabled="true"
    stackWidth="1.24" stackLength="0.84"
    stackHeight="0.82" maxStackLayers="2"
    stackFullOnly="true" fullFillLevel="1000" />
```

Parameter	Default	What does the value mean?
enabled	false	true allows OSV to display this pallet in stacks.
stackWidth / stackLength	Normal pallet size	Width and length of one pallet position in metres.
stackHeight	Normal pallet height	How many metres higher each next pallet is placed. 0.82 puts the second pallet 0.82 m above the first and the third 1.64 m above it.
maxStackLayers	No extra limit	Maximum number of pallets in one stack. Storage height also limits it.
stackFullOnly	false	true stacks only full pallets. false also permits empty or partially filled ones.
fullFillLevel	Automatic	Amount considered full for this pallet. When omitted, taken from start fill or capacity.
palletGroup	Automatic	Assigns the pallet to a group for the rotation switches in section 7.

palletGroup accepts euroPallet, bigBagPallet, squarePallet, largePallet and bigBag. Assigning a group alone does not enable stacking.

If feet or stacking guides interlock, stackHeight can be smaller than the full crate height. Use the distance at which two stacked crates actually rest on one another.

10 Store refillable crates

A potato crate or box may not be accepted by GIANTS objectStorage even though it can be filled normally in game. This entry lets OSV store such crates in pallet storage.

Add this to the crate XML

Find the closing **</vehicle>** line and insert the entry immediately before it:

```
<objectStorageReusablePallet enabled="true" />
```

Keep the other entries in your crate XML. An existing pallet storage needs no additional entry for this crate.

Parameter	Default	What does it do?
enabled	false	true allows this crate to be stored through OSV. false explicitly excludes it.
fillUnitIndex	1	Number of the fillUnit in the crate XML. A crate with one fillUnit uses 1, so you can omit this parameter.

Which crates is this for?

The crate needs **exactly one fillUnit for its contents**. A fillUnit is the <fillUnit> entry that defines, for example, capacity and accepted crops. fillUnitIndex is its number, counted from 1 - not a litre amount or a crop ID.

The entry is for normal refillable crates. It is not intended for self-propelled vehicles, trailers, attachable implements, big bags or consumable pallets. It does not add missing filling or discharge functions.

Also stack the crate

To display the crates in stacks, also add objectStorageStacking from section 9. Width, length and stacking distance must match your crate. The storage opt-in alone does not define these stacking values.

11 Common integration problems

Problem	Check the cause / entry
Underlay pallets missing	Set both baleStorageVisuals enabled="true" and palletUnderlays enabled="true".
Loading area does not move	Add slotTrigger enabled="true" inside the correct block: palletStacking for pallets, baleStorageVisuals for bales.
Menu opens at the wrong place	Check movePlayerTrigger and playerTriggerOffset. Menu interaction and loading use separate triggers.
Only one layer in a rack	Check stackInMultiLevelStorage, compartment maxHeight and the pallet's maxStackLayers.
Pallets overlap posts	Keep posts outside the storageAreas. OSV does not automatically detect the building geometry.
Gap between stacked crates	stackHeight is too large. Use the distance between two crates resting correctly on each other.
Crates overlap	stackHeight is too small or model dimensions are wrong. Values must match the actual crate.
Crate not accepted	Put objectStorageReusablePallet in the crate XML. Cargo and dimensions must also meet the storage's normal admission rules.
Storage rejects objects despite free count	With dynamicCapacity, usable space matters. Check group areas, dimensions and hardLimit.